

Unique Power Dense, Configurable, Robust, High-Voltage Power Supplies, Phase I

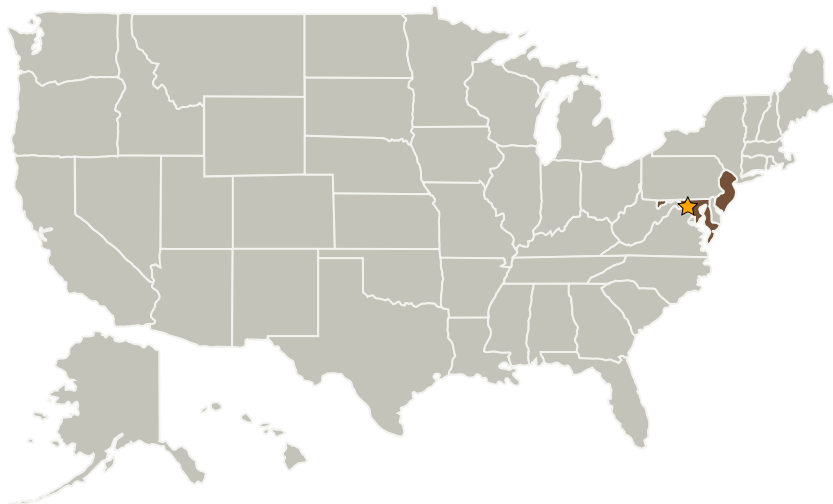
Completed Technology Project (2007 - 2007)



Project Introduction

Princeton Power will develop and deliver three small, lightweight 50 W high-voltage power supplies that have a configurable output voltage range from 500 to 50 kVDC. The baseline 1 kV design will have 85% efficiency, operate from a 20-30 VDC supply, occupy 108 mL (460W/liter), and weigh 200 g. The design will use an innovative resonant DC-DC boost converter with simple controls and a robust passive switching technique. Our patented AC-link power electronics technology configured in a soft-switching DC-DC design enables the use of a small internal transformer and 100 kHz switching frequency, to make a power-dense, reliable, efficient system. The configurable transformer ratio and modular output section permit a wide range of output voltages. The project risk is minimal due to our reference prototypes, which have demonstrated high-voltage DC-DC conversion, high-frequency switching, and thermal management in power-dense, sealed packages. During Phase I we will deliver a prototype unit, including a detailed design analysis and production cost estimate. In Phase II we will optimize the design to become space-qualified for shock, vibration, interface, EMI, form factor, and other relevant specifications. For our Phase III manufacturing efforts, GHO Ventures is interested in providing funding and Transistor Devices (TDI) has expressed interest in providing manufacturing facilities and expertise.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Princeton Power Systems, Inc.	Supporting Organization	Industry	Princeton, New Jersey

Primary U.S. Work Locations

Maryland	New Jersey
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.3 Power Management and Distribution
 - └ TX03.3.3 Electrical Power Conversion and Regulation